

CLAIMS

What is claimed is:

1. A display comprising:

5 a display screen;

a transparent panel having a backside and an anti-glare front surface configured to diffuse ambient light; and

10 a bulk diffuser disposed between the display screen and the backside, wherein the bulk diffuser is bonded to at least one of the display screen and the transparent panel, and the bulk diffuser is configured to diffuse image light of the display.

15 2. The system of claim 1, wherein the display screen comprises a liquid crystal display screen.

3. The system of claim 1, wherein the transparent panel comprises a glass panel.

20 4. The system of claim 1, wherein the transparent panel comprises a molded plastic panel.

5. The system of claim 1, comprising an anti-reflective layer disposed on the anti-glare front surface.

6. The system of claim 1, wherein the anti-glare front surface comprises a surface texture.

5 7. The system of claim 6, wherein the surface texture comprises a chemically etched surface texture.

8. The system of claim 6, wherein the surface texture comprises a mechanically ground surface texture.

10 9. The system of claim 6, wherein the surface texture comprises a molded surface texture.

15 10. The system of claim 6, wherein the bulk diffuser is configured to reduce undesirable optical effects caused by the surface texture.

11. The system of claim 1, wherein the bulk diffuser comprises a diffusive material configured to diffuse light within the diffusive material.

20 12. The system of claim 1, comprising an index-matched bond material disposed between the bulk diffuser and at least one of the display screen and the transparent panel.

13. The system of claim 12, wherein the index-matched bond material is substantially bubble-free.

14. The system of claim 12, wherein the index-matched bond material comprises an epoxy.

15. The system of claim 1, comprising bond layers disposed between the bulk diffuser and both of the display screen and the transparent panel.

16. A method for manufacturing a display having a display screen, the method comprising the acts of:

positioning a bulk diffuser between the display screen and an anti-glare front layer, wherein the bulk diffuser comprises a diffusive material configured to scatter light within the diffusive material; and

bonding the bulk diffuser to at least one of the anti-glare front layer and the display screen.

17. The method of claim 16, wherein the display screen comprises a liquid crystal display.

18. The method of claim 16, wherein the anti-glare front layer comprises a transparent panel.

19. The method of claim 18, wherein the transparent panel comprises a glass panel.

20. The method of claim 18, wherein the transparent panel comprises an anti-reflective
5 coating.

21. The method of claim 18, wherein the anti-glare front layer comprises a surface
texture configured to diffuse ambient light.

10 22. The method of claim 21, wherein the surface texture comprises a chemically etched
surface texture.

23. The method of claim 21, wherein the surface texture comprises a mechanically
ground surface texture.

15 24. The method of claim 21, wherein the surface texture comprises a molded surface
texture.

25. The method of claim 21, comprising the act of:

20 coarsening the surface texture to enhance the performance of the anti-glare front layer.

26. The method of claim 25, wherein the act of positioning the bulk diffuser comprises the act of:

reducing color separation effects caused by the surface texture.

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27. The method of claim 16, wherein the act of positioning the bulk diffuser comprises the act of:

reducing undesirable optical characteristics caused by the anti-glare front layer.

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28. The method of claim 16, wherein the act of bonding comprises the act of:

bonding using an index-matched bond material.

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29. The method of claim 16, wherein the act of bonding comprises the act of:

bonding using an epoxy.

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30. The method of claim 16, wherein the act of bonding comprises the act of:

bonding the bulk diffuser to both the anti-glare front layer and the display screen.

31. The method of claim 16, wherein the act of bonding comprises the act of:

bonding the bulk diffuser to a light control layer disposed adjacent one of the anti-glare
front layer and the display screen.

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32. The method of claim 16, comprising the acts of:

positioning a plurality of elongated lamps behind the display screen; and

positioning a reflector panel behind the plurality of elongated lamps.

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33. The method of claim 32, comprising the act of:

positioning a diffuser screen between the display screen and the plurality of elongated
lamps.

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34. The method of claim 32, comprising the act of:

positioning a plurality of light control layers between the display screen and the plurality of
elongated lamps.

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35. A method of forming a display, the method comprising the acts of:

flowing a bond material onto a side portion of a bond surface of a first layer of a plurality of display layers;

aligning a feature of a second layer of the plurality of display layers with a feature of the first layer to form a junction;

rotating and pressing the second layer onto the first layer starting from the junction and proceeding evenly across the second layer to form a substantially uniform bond layer of the bond material between the first and second layers; and

curing the bond material.

36. The method of claim 35, comprising the act of:

preparing a surface of one of the plurality of display layers for bonding.

37. The method of claim 35, comprising the act of:

preparing the bond material.

38. The method of claim 37, wherein the act of preparing the bond material comprises the act of:

mixing components of an epoxy.

39. The method of claim 37, wherein the act of preparing the bond material comprises the act of:

removing bubbles from the bond material.

40. The method of claim 37, wherein the act of preparing the bond material comprises the act of:

agitating the bond material in a vacuum environment.

41. The method of claim 35, wherein the act of flowing the bond material comprises the act of:

continuously flowing the bond material.

42. The method of claim 35, comprising the acts of:

forming a dam around the first layer to contain the bond material; and

forming a substantially uniform layer of the bond material on the side portion.

43. The method of claim 35, wherein the first layer comprises a display screen and the second layer comprises a diffusion layer, the diffusion layer comprising a diffusive material configured to diffuse light within the diffusive material.

5 44. The method of claim 43, wherein the display screen comprises a liquid crystal display.

10 45. The method of claim 35, wherein the first layer comprises a diffusion layer and the second layer comprises an anti-glare panel, the diffusion layer comprising a diffusive material configured to diffuse light within the diffusive material and the anti-glare panel comprising a textured surface configured to diffuse ambient light.

15 46. The method of claim 45, comprising the act of:

coarsening the textured surface to enhance the performance of the anti-glare front layer.

47. The method of claim 46, comprising the act of:

providing a desirable type and thickness of the diffusive material to reduce color separation

20 effects caused by the textured surface.

48. The method of claim 45, comprising the act of:

coarsening the textured surface to increase ambient light diffusion by the anti-glare panel;

providing the diffusion layer to increase image light diffusion for reducing undesirable effects caused by the anti-glare panel; and

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balancing characteristics of the textured surface and the diffusion layer to provide a desirable ambient light diffusion and to provide a desirable image quality.

49. The method of claim 43, comprising the acts of:

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flowing the bond material onto a portion of a surface of the diffusion layer;

aligning an anti-glare panel with the diffusion layer to form a bond junction, wherein the anti-glare panel comprises a textured surface configured to diffuse ambient light; and

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rotating and pressing the anti-glare panel onto the diffusion layer starting from the junction and proceeding evenly across the diffusion layer to form a substantially uniform bond with the bond material between the diffusion layer and the anti-glare panel.

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50. The method of claim 35, comprising the acts of:

applying pressure to the second layer using a flat-headed device; and

sliding the flat-headed device between opposite edges of the second layer in a substantially parallel orientation relative to the opposite edges.

5 51. The method of claim 35, comprising the acts of:

forming a wedge between the first and second layers; and

evenly pressuring the wedge to flow the bond material between the first and second layers.

10 52. The method of claim 51, wherein the act of evenly pressuring the wedge comprises the act of:

steadily pressuring the bond material to flow substantially bubble free.

15 53. The method of claim 35, comprising the act of:

index matching the bond material with the plurality of display layers.

20 54. The method of claim 35, comprising the acts of:

positioning a plurality of elongated lamps behind the first layer, the first layer comprising a display screen; and

positioning a reflector panel behind the plurality of elongated lamps.

55. The method of claim 35, comprising the act of:

forming a multi-layered bonded display structure comprising the plurality of display layers.

56. The method of claim 55, comprising the act of:

retrofitting the multi-layered bonded display structure into the display.

57. The method of claim 35, wherein the act of curing comprises the act of:

heating the bond material for a desired cure time.